SPECIFICATION

HOST COMPUTER, MOBILE COMMUNICATION APPARATUS, PROGRAM AND STORAGE MEDIUM

TECHNICAL FIELD

The present invention relates to a host computer, a mobile communication apparatus, a program and a storage medium for the use of authentication system for supplying various kinds of commodities and services.

BACKGROUND ART

At present, the supply of various kinds of commodities including services via a communication line such as the supply of Internet contents and the transactions at Internet Malls is rapidly spreading, and the terminals used for them widely range from the personal computer to the mobile communication apparatus and various kinds of household electrical appliances. In other words, there is a possibility that in future almost all the electronic equipment, service equipment and other equipment will be provided with a function to purchase chargeable commodities via the communication line.

Further, with spread of financial services such as credit card business and the like, billing forms are diversified and utility for the consumer is enhanced. These financial services are fused together with the mobile communication apparatus and expected to further enhance utility. On the other hand, however, there arises a problem that debit cards are forged or robbed.

In view of the above described circumstances, the importance of authenticating customers who purchased the commodities is further increased. Nevertheless, if a

1

complicated operation for authentication is required every time the equipment is used, utility will be hindered.

The present invention has been made in view of the above background and it is an object of the present invention to provide an authentication system and a host computer, a mobile communication apparatus, a program and a storage medium for the authentication system capable of realizing an adequate authenticating processing while assuring the maximum utility of the user when various kinds of commodities and services are provided.

DISCLOSURE OF THE INVENTION

In order to achieve the above described object, the host computer according to the present invention comprises:

first receiving means for receiving the collation information for requesting an authentication of the person himself from service equipment;

second transmitting means for transmitting a request information for requesting the information regarding the authentication to the mobile communication apparatus in response to the reception of the collation information by the first receiving means;

second storage means for storing the information regarding the authentication of a plurality of persons;

second receiving means for receiving the information regarding the authentication from the above described mobile communication apparatus;

collating means for collating the information regarding the authentication received by the second receiving means with the information regarding the authentication stored in the above

2

described second storage means; and

first transmitting means for transmitting the authentication information which authenticates the person himself according to the collation result by collating means to the above described service equipment.

Further, the information regarding the above described authentication is the ID information of the user or the personal attributes of the user.

Further, the above described first receiving means receives the information regarding the services provided by the service equipment, and

the host computer further comprises authentication selection means for selecting an authentication level according to the information regarding the services.

Further, the above described authentication selection means collates a past service provided history with the services to be provided at present and selects the authentication level based on the result of that collation.

Further, the above described authentication selection means selects an authentication level based on at least any one of costs of services, service providing areas, service provided frequency and a total sum of money for the services provided.

Further, in order to achieve the above described object, the mobile communication apparatus according to the present invention comprises:

third receiving means for receiving the request information for requesting the information regarding the authentication from the host computer;

first storage means for storing the information regarding the authentication; and

third transmitting means for transmitting the information regarding the authentication stored in the first storage means to the above described host computer in response to the reception of the request information by the above described third receiving means.

Further, the mobile communication apparatus comprises fourth transmitting means for transmitting the information regarding the authentication to the service equipment.

Further, the above described third transmitting means selectively transmits the information regarding the type of authentication requested by the above described request information to the above described host computer.

Further, the function of the mobile communication apparatus according to the present invention can be also realized by allowing the computer to execute a program and such a program can be mounted on a storage medium capable of being read by the computer.

The authentication method by using the host computer and the mobile communication apparatus according to the present invention (hereinafter, referred to as the authentication method according to the present invention) is based on both of the communications between the first communication terminal incorporated in the service equipment and the host computer and between the host computer and the mobile communication apparatus (the second communication terminal). In this way, the reliability of the authentication can be enhanced. In this way, when various kinds of commodities and services are provided, the maximum utility can be guaranteed for the customer and an adequate authentication processing can be realized.

Further, in the authentication method according to the

present invention, in the case of the communication between the host computer and the mobile communication apparatus (the second communication terminal), the user may be asked about the information regarding the user's ID (identification information) or the personal attributes of the user and, based on the answer thereto, the authentication may be performed.

Further, in the service equipment according to the present invention, a card reader for reading the information from the storage medium where the user's ID information is stored is further provided, and the service equipment can read the ID information of the storage medium. The authentication method according to the present invention is such that the first communication terminal transmits the ID information read by the card reader to the host computer and the host computer notifies the mobile communication apparatus (the second communication terminal) of the ID information based on this information and confirms the response of the mobile communication apparatus (the second communication terminal) for this. In this way, by utilizing the conventional storage medium, utility and reliability can be enhanced.

Further, in the authentication method according to the present invention, further in the case of the communication between the host computer and the mobile communication apparatus (the second communication terminal), the identifiable communication information between the first communication terminal and the mobile communication apparatus (the second communication terminal) is notified to the mobile communication apparatus and this information is confirmed by being collated with the information necessary for authenticating a communication history, a control transfer history and the like

5

and, based on this confirmation result, the authentication is performed. In this way, the reliability of authentication can be enhanced much more.

Further, in the authentication method according to the present invention, a plurality of authentication levels and a control transfer permission condition according to each authentication level are stored in advance in the second storage means of the host computer or the third storage means of the service equipment so that, when the user desires the authentication of the person himself, an authentication level can be selected according to the object of the authentication. In other words, the authentication level can be selected by collating the past service provided history with the services to be provided at present.

Further, in the authentication method according to the present invention, when the object of the authentication is to purchase commodities, the commodities are collated with the amount of money for the commodities and the past commodity purchasing history and the authentication level is selected, based on the result of the collation. In this way, utility can be enhanced.

Further, in the present invention, the host computer may automatically analyze a tendency of commodity purchasing of the user and collate the analyzing result with the commodities.

Further, in the authentication method according to the present invention, when the object of the authentication is to purchase the commodities, the authentication level can be selected based on at least any one of cost of services, service providing areas, service provided frequency and a total sum of money for the services provided. In this way, utility can be

6

enhanced.

Further, in the present invention, the service equipment is the equipment capable of providing the commodities to the user and may provide the commodities by confirming a billing processing for the user after the authentication of the user has been performed.

Further, in the authentication method according to the present invention, the first communication terminal and the host computer are connected by the mobile communication line, and the host computer and the mobile communication apparatus (the second communication terminal) are connected by the mobile communication line. In this way, the degree of freedom of the place and the like for installing the first communication terminal is enhanced.

Further, in the authentication method according to the present invention, the first communication terminal and the host computer are connected by a fixed line, and the host computer and the mobile communication apparatus (the second communication terminal) are connected by the mobile communication line. In this way, the reliability of the communication of the first communication terminal is enhanced.

Further, in the authentication method according to the present invention, when a line condition is not good between the mobile communication apparatus (the second communication terminal) and the host computer, the communication which should be performed between the mobile communication apparatus (the second communication terminal) and the host computer can be executed between the first communication terminal and the host computer. In this way, a line trouble can be easily handled.

The present specification contains the contents described

7

in the specification and/or the drawings of Japanese Patent Application No. 2000-193957 which is a base of the priority of the present patent application.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 is a block diagram showing a constitution of a first embodiment of an authentication system according to the present invention;

FIG.2 is a block diagram showing the constitution of a second embodiment of the authentication system according to the present invention;

FIG.3 is a block diagram showing the constitution of a third embodiment of the authentication system according to the present invention;

FIG.4 is a block diagram showing the constitution of a fourth embodiment of the authentication system according to the present invention;

FIG.5 is a view showing modified embodiments of the constitutions of the first and second communication terminals in the authentication system of FIG.3;

FIG.6 is a flowchart showing a processing flow of the whole authentication system according to the present invention; and

FIG.7 is a flowchart showing the flow of the correction of the authentication level in the authentication system according to the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Next, the embodiments of the authentication system constituted by using a host computer, a mobile communication apparatus, a program and a storage medium according to the present

8

invention (hereinafter, referred to as authentication system according to the present invention) will be described based on the drawings.

FIG.1 shows a constitution of a first embodiment of the authentication system according to the present invention, and shows the authentication system having a card reader system CRS for reading a storage medium CC for storing the ID information of users of a credit card and the like.   The card reader system CRS (service equipment) is connected to a card reader CR and the first communication terminal PD1 (here for mobile communication) of a built-in type (embedding type) is incorporated into the card reader system CRS.   Through the first communication terminal PD1, the user (customer) can communicate with a host computer HC of an authentication management company BS.   The authentication management company BS is, for example, a communication service company and performs the authentication management for a plurality of commodity providing companies SP1 to SP3 (three companies are shown in the drawing, but its number is random) according to commodity purchasing situations in the card reader system CRS (service equipment).   The commodity providing companies SP1 to SP3 include not only the service providing companies which provide the services such as credit services, cash services and the like but also the commodity providing companies which provide various commodities as shown in Table 1 via the Internet and, further, include financial institutions, security companies, real estate companies, satellite broadcasting, CATV, newspapers, radio broadcasting, companies relating to mass communication such as publishing and the like.

Here, for convenience sake, processing units of the

commodity providing companies SP1 to SP3 are also designated as SP1 to SP3. These processing units SP1 to SP3 are connected to a host computer HC of the authentication management company BS via a public communication line or dedicated line.

Table 1. Examples of provided commodities

PROVIDED COMMODITIES	
INTERNET CONTENTS	INFORMATION PROVIDING SERVICES FOR COMMODITY INFORMATION, COMPANY INFORMATION AND OTHER INFORMATION
	MUSIC DISTRIBUTION SERVICES
	BOOK DISTRIBUTION SERVICES
	GAME DISTRIBUTION SERVICES
	SERVICES FOR PROVIDING IMAGE INFORMATION SUCH AS PHOTO, PAINTING AND THE LIKE
INTERNET MALL, SHOP CHANNEL	VARIOUS KINDS OF COMMODITIES, MONEY VOUCHER
FINANCE	INTERNET BANKING
SECURITIES	BROKERAGE OF SECURITIES DEALING
REAL ESTATE	BROKERAGE OF REAL ESTATE DEALING
MASS COMMUNICATION	SATELLITE BROADCASTING, CATV
	NEWSPAPERS, PUBLICATION
	RADIO

The host computer HC comprises: the first receiving means for receiving the collation information for requesting an authentication of the person himself from the service equipment; the second transmitting means for transmitting the request information for requesting the information regarding the authentication to the mobile communication apparatus PD2 (the second communication terminal, here a portable telephone) in response to the reception of the collation information by the first receiving means; the second storage means MEM 2 for storing the information regarding the authentication of a plurality of persons; the second receiving means for receiving the information regarding the authentication from the mobile communication apparatus (the second communication terminal); the collation

10

means for collating the information regarding the authentication received by the second receiving means with the information regarding the authentication stored in the second storage means MEM 2; and the first transmitting means for transmitting the authentication information for authenticating the person himself to the service equipment according to the collation result by the collation means.

Further, the mobile communication apparatus (the second communication terminal) PD2 comprises: the third receiving means for receiving the request information for requesting the information regarding the authentication from the host computer HC; the first storage means MEM 1 for storing the information regarding the authentication; and the third transmitting means for transmitting the information regarding the authentication stored in the first storage means MEM 1 to the host computer HC in response to the reception of the request information by the third receiving means.

Next, the authentication method using the host computer HC and the mobile communication apparatus (the second communication terminal) PD2 will be described.

First, from the first communication terminal PD1 of the service equipment (card reader system) CRS to the host computer HC, the collation information for requesting the authentication of the person himself is transmitted.

When the host computer HC receives the collation information for requesting the authentication of the person himself from the first communication terminal PD1 through the first receiving means, it transmits the request information for requesting the information regarding the authentication to the mobile communication apparatus (the second communication

terminal) PD2 through the second transmitting means in response to the reception of the collation information by the first transmitting means.

When the mobile communication apparatus (the second communication terminal) PD2 receives the request information for requesting the information regarding the authentication from the host computer HC through the third receiving means, it transmits the information regarding the authentication stored in the first storage means MEM1 to the host computer HC through the third transmitting means in response to the reception of the request information by the third receiving means.

When the host computer HC receives the information regarding the authentication from the mobile communication apparatus (the second communication terminal) PD2 through the second receiving means, it collates the information regarding the authentication received by the second receiving means with the information regarding the authentication stored in the second storage means MEM2 by using the collation means, and transmits the authentication information for authenticating the person himself to the first communication terminal PD1 of the service equipment (card reader system) CRS through the first transmitting means according to the collation result.

On the occasion of executing an authentication procedure as to whether the use of storage medium CC is justified or not, a signature by the user is required heretofore. In the present embodiment, in order to reduce the burden on the part of the user and speed up the authentication processing, when the usage of the CC storage medium as the collation information is communicated to the host computer HC from the card reader system CRS, the host computer HC of the authentication management

company BS communicates with the second communication terminal PD2 (mobile communication apparatus, portable telephone) owned by the user and requests the information regarding the authentication.

The second communication terminal PD2 is provided with the storage means MEM1 for storing the ID information of users, and, in response to the request from the host computer HC, the ID information of the user (the information regarding the authentication) is read from the first storage means MEM1 and transferred to the host computer HC. When the host computer HC receives the ID information of the user from PD2, it collates the ID information with the information regarding the authentication stored in the second storage means MEM2 by using the collation means. If the use of the storage medium CC is legitimate, the authentication of the person himself is established and, in this way, the reliability of the authentication is enhanced.

Alternatively, the host computer HC accumulates the information regarding the personal attributes of the user in the second storing means MEM2 in advance and asks a question regarding the personal attributes of the user to the second communication terminal PD2. When the user operates the second communication terminal PD2 and answers the question to the host computer HC and the answer (information regarding the personal attributes) is legitimate, the host computer HC can confirm that the use of the storage medium CC by the user is legitimate. Further, the second communication terminal PD2 can selectively transmit the information regarding the type of the authentication requested by the request information from the host computer HC to the host computer HC.

For the user who is skilled in operating the second communication terminal (portable telephone) PD2, the authentication processing by using the second communication terminal PD2 is extremely simple in contrast to the entry of a sign. Further, the reliability of the authentication can be remarkably enhanced by the confirmation of the second communication terminal PD2 in addition to the ID information of the storage medium CC.

When the authentication of the person himself is completed in the host computer HC, the authentication information is transmitted to the first communication terminal PD1 from the host computer HC. The notification of this authentication is executed by transmitting a predetermined authentication code and the like.

Further, the mobile communication apparatus (the second communication terminal) PD2 comprises the fourth transmitting means for transmitting the information regarding the authentication to the service equipment and, by adding the communication between the first communication terminal PD1 and the second communication terminal PD2 to the conditions of the authentication, the utility and reliability of authentication can be enhanced much more. For example, the ID information of the user and other information are transmitted from the second communication terminal PD2 to the first communication terminal PD1, and the first communication terminal PD1 transmits these pieces of information sent from the second communication terminal PD2 together with the ID information of the storage medium CC to the host computer HC. The host computer HC is provided with the second storage means MEM2, and the second storage means MEM2 stores a corresponding relation (any information regarding the

14

communication history or the control transfer history of each user who uses the card reader system CRS) between the ID information of the user and the second communication terminal PD2 of the user, and, based on this corresponding relation, the host computer HC transmits the ID information of the above described storage medium CC and the information regarding the corresponding relation to the second communication terminal PD2. The second communication terminal PD2 collates these pieces of information transmitted from the host computer HC with the communication history, the control transfer history and the like stored in the first storage portion MEM1 of the second communication terminal PD2 and, when these pieces of information match one another, a reply to that effect is given to the host computer HC.

As described above, in the present embodiments, though various kinds of authentication procedures can be used, by determining a reference for selecting the authentication procedure according to the object of the authentication, the optimum utility and reliability can be realized. For example, when the object of the authentication is to purchase the commodities, the authentication level can be set by the price thereof as shown in Table 2, and the authentication procedure for this can be set as shown by Table 3.

Table 2. Examples of the authentication levels

Authentication Level 1
In case: the price of the commodity is equal to or less than a first predetermined value. The first predetermined value is, for example, ¥5,000.
Authentication Level 2
In case: the price of the commodity is more than the first predetermined value and is equal to or less than a second predetermined value. The second predetermined value is, for example, ¥10,000.
Authentication Level 3
In case: the price of the commodity is more than the second predetermined value.

Table 3. Examples of control transfer permissions;

Authentication Level 1
It is unconditionally authenticated, provided that an ex post facto confirmation should be made to the second communication terminal.
Authentication Level 2
Authentication management company BS makes a prior confirmation about the commodity purchase to the second communication terminal PD2.
Authentication Level 3
Authentication management company BS makes a prior confirmation about the commodity purchase to the first communication terminal PD1 and the second communication terminal PD2.

In other words, when the price of the commodity is equal to or less than the first predetermined value, the authentication level 1 is adapted and it is unconditionally authenticated. However, a prior confirmation is executed to the second communication terminal PD2. When the price of the commodity is more than the first predetermined value and is equal to or less than the second predetermined value, the authentication level 2 is adopted, and the authentication management company BS makes a prior confirmation about the purchase of the commodity to the second communication terminal PD2. When the price of the commodity is more than the second predetermined value, the

16

authentication level 3 is adopted, and the authentication management company BS makes a prior confirmation about the purchase of the commodity to the first communication terminal PD1 and the second communication terminal PD2.

The first receiving means of the host computer HC is provided with authentication selection means for receiving information regarding the services provided from the service equipment and selecting the authentication level according to the information regarding the services, so that the authentication procedure can be changed according to the authentication level. In other words, when the host computer HC which stores the authentication levels and the authentication procedure in the second storage means MEM2 receives the information regarding the collation information for requesting the authentication of the person himself and the information regarding the services from the first communication terminal PD1 through the first receiving means, the host computer HC selects the collation levels according to the information regarding the services with reference to the second storage means MEM2 by using the authentication selection means. After that, in order to perform the authentication procedure based on the authentication level, the host computer HC either transmits the request information for requesting the information regarding the authentication to the mobile communication apparatus (the second communication terminal) through the second transmitting means for the purpose of a prior confirmation or performs an ex post facto confirmation. In the case that the prior confirmation is performed, the host computer HC transmits the authentication information to perform the authentication of the person himself according to the collation result to the first

17

communication terminal PD1 of the service equipment (card reader system) CRS through the first transmitting means.

When the authentication by the host computer HC is not necessary similarly to the processing of the authentication level 1, the authentication levels and the authentication procedure are stored in the third storage means MEM3 of the first communication terminal PD1, so that the first communication terminal PD1, that is, the card reader system CRS (service equipment) can provide the commodity to the user without awaiting reception of an authentication code from the host computer HC if it is confirmed that the price of the commodity is equal to or less than the first predetermined value. However, an ex post facto confirmation should be made to the second communication terminal and, after the facto, the commodity providing company SP should be notified to that effect via the host computer HC.

FIG.2 shows a second embodiment which uses the first communication terminal T1 of a fixed line in place of the first communication terminal PD1 (for mobile communication) in the first embodiment. The first communication terminal T1 is incorporated into the card reader system CRS (service equipment). Other constitutive components are same as those of the first embodiment and the description thereof will be therefore omitted. By the above described constitution, even if the line condition of the mobile communication in the installed location of the service equipment is not good, the authentication system of the present invention can be adapted.

When the first communication terminal T1 of the fixed line is used, the authentication procedure by the communication between the second communication terminal PD2 and the host computer HC can be also executed by the communication between

18

the first communication terminal T1 and the host computer HC.
This is effective in the case that the line of the second
communication terminal is in a bad condition.

FIG.3 shows a third embodiment for the authentication in
the television set TV (service equipment) which can be connected
to the Internet.   The first communication terminal PD1 (here
for the mobile communication) of the built-in type (embedded
type) is incorporated into the television set TV, which can
communicate with the authentication management company BS via
the first communication terminal PD1.

The owner or the manager of the service equipment TV can
make an access to a variety of commodity providing companies
by a predetermined authentication procedure by using the first
communication terminal PD1.   By using a dynamic image display
function or a distributing function of the television set TV,
a limit to tradable commodities is reduced and economic
activities become remarkably brisk.

Further, if the television set TV can be used by many and
unspecified customers, a wider range of customers' needs can
be tackled, and economic activities can become remarkably brisk.
However, in this case, it is necessary to perform an adequate
billing for the customer who uses the television set TV (service
equipment), and there is such a risk that the authentication
and the billing procedure for each customer become complicated.

Further, in the present embodiment, when the billing for
the purchase of the commodities is owed by each customer, a
"control transfer mode" which transfers the control regarding
the billing to the customer's side can be set up.   When the
"control transfer mode" is set up, a plurality of customers settle
their payment after the completion of authentication of the

person himself, so that it is impossible for the owner or the manager of the service equipment to be charged with the fee.

The customer (not shown) calls up the first communication terminal PD1 (used by a plurality of customers) from the second communication terminal PD2 (mobile communication apparatus, here portable telephone) which is owned by himself, and inputs a predetermined code (number, reference numeral and the like), so that the service equipment TV can be used for the purpose of the billing for the customer. In this way, if the customer is guaranteed to be a legitimate customer by the authentication of the second communication terminal PD2, a customer authentication is possible such that the second communication terminal PD2 itself is taken as the ID information, and an adequate billing can be performed.

Further, the operation of the customer authentication is relatively simple and does not damage utility.

On this occasion, the information regarding the billing is transmitted from the first communication terminal PD1 to the host computer HC of the authentication management company BS.

Accordingly, regardless of the "control transfer mode" being utilized or not, the information regarding the billing may be transmitted together with the information regarding the authentication, and it is not necessary to change the transmission form of billing information on the service equipment TV.

When a predetermined "condition" is satisfied, the authentication management company BS permits the supply of the commodities by confirming the billing processing for the customer. The authentication level and condition are same as those of the above described preferred embodiment.

20

Although the authentication levels of Table 2 are set up only by the prices of the commodities, as shown in Table 4, it can be corrected based on the commodity purchase history from the second communication terminal PD2.

Table 4. Example of corrections of authentication levels.

Authentication Level not modified
(1) In case: The commodity purchase history of the second communication terminal PD2 recorded in the authentication management company BS is less than a predetermined value. The predetermined value is set by comprehensively judging the number of purchase times and the purchase amount of money. (2) In case: The commodity purchase history of the second communication terminal PD2 recorded in the first communication terminal PD1 is less than a predetermined value. The predetermined value is set by comprehensively determining the number of purchases and the amount of purchases, similarly to (1).
Authentication Level lowered by 1.
(1) In case: The commodity purchase history of the second community terminal PD2 recorded in the authentication management company BS is more than a predetermined value. (2) In case: The commodity purchase history of the second communication terminal PD2 recorded in the first communication terminal PD1 is more than a predetermined value.

In the estimation of the purchase history in Table 4, on condition that the purchase amount of money is adequately used, a comprehensive estimation is made, for example, assuming that the purchase amount of money ¥100,000 is taken as a predetermined value of the purchase history, even if the purchase amount of money is less than ¥100,000, ten times of the purchases are changed into the purchase of ¥10,000 and added to the purchase history.

Further, the authentication level can be selected by collating the past service providing history with the services to be provided at present or the authentication level can be selected based on at least any one of the cost of services, service providing areas, service provided frequency and the total sum

21

of money for the services provided.

As described above, by adequately simplifying the authentication procedure according to the authentication level, the utility of service equipment regarding the commodity provision can be remarkably enhanced.

It is also possible to use other parameters, for example, the area of the first communication terminal, the first communication terminal itself, the kind of the commodity and the like for setting and correcting the authentication levels.

Further, in the host computer HC, it is also possible to automatically analyze the tendency of the purchased commodities of the user to lower the authentication level for the purchase of the commodities complying with the analyzed result and raise (to be strict with) the authentication level regarding the purchase of the commodities different from the past tendency.

FIG.4 shows a fourth embodiment which uses the first communication terminal T1 of the fixed line in place of the first communication terminal PD1 (for the mobile communication) in the third embodiment. Other constitutive components are same as those of the third embodiment and description thereof will be therefore omitted. By the above described constitution, even if the line condition of the mobile communication in the location of the service equipment TV installed is not good, the authentication system of the present invention can be adapted. Such a constitution can be also adapted that the service equipment TV is taken as the first communication terminal T1 and a telephone set TV (T1) of the fixed line is used.

FIG.5 shows a modified embodiment which uses the first communication terminal (for the mobile communication) PD1 and the second mobile communication terminal (mobile communication

apparatus, portable telephone) PD2 in a third embodiment. Label tags TG1, TG2 are incorporated into the first and second mobile communication terminals PD1, PD2 respectively and send intrinsic signals of the first and second communication terminals PD1, PD2. The signals of label tags TG1, TG2 are received respectively by the antennas of the first and second communication terminals PD1, PD2 and, when both are detected by each other, the service equipment TV transmits the billing information as the billing for the second communication terminal PD2 to the authentication management company BS. In other words, the first and second communication terminals PD1, PD2 operate as non-contact sensors and detect electrical indexes emitted by label tags TG1, TG2. By PD1, PD2 being automatically detected by each other in this way, it is not necessary to perform a complicated operation such as calling up the first communication terminal PD1 from the second communication terminal PD2 and inputting the code.

Needless to mention, radio communications by BLUETOOTH standards can be adopted in place of the communications by label tags. Further, the authentication management company BS may be the same as the commodity providing company and, in this case, the authentication system can be simplified.

FIG.6 is a flowchart showing one example of the flow of the whole authentication system based on the control transfer request. Here, the correction of the authentication level shown in Table 4 is not performed, and a processing which adopts only the conditions of Table 2, Table 3 is shown.

First, by the operation that the second communication terminal PD2 calls up the first communication terminal PD1 and the like, it is determined whether a request for the control

transfer is made or not (step S41) and, when the request is not made, the process is finished.

When the request for the control transfer is made, the request contents from the second communication terminal PD2, that is, the commodities desired to be purchased, the prices thereof and the like, and the information regarding the authentication such as the ID information regarding the billing of the customer and the like are transmitted to the authentication management company BS (step S42). In the first communication terminal, based on Table 2 and Table 3, it is determined from the commodity prices whether or not the prices are of the low level which does not require an approval from the authentication management company BS. If the approval is not required, the commodities are immediately provided (step S45). If the approval is required, the commodities are provided (step S45) when the approval from the authentication management company BS is granted (step S44). When the approval is not granted, a notification to the effect that the approval is not granted is notified to the second communication terminal PD2 (step S46).

After the commodities are provided, it is determined whether an ex post facto confirmation is required or not (step S47) based on the Authentication level 1 in Table 3. When the ex post facto confirmation is required, the information regarding the purchase of the commodities and the like is transmitted from the authentication management company BS to the second communication terminal PD2 and the like (step S48).

FIG.7 is a flowchart showing the flow of the processing of the authentication system which performs the correction of the authentication levels shown in Table 4.

First, by the operation that the second communication

24

terminal PD2 calls up the first communication terminal PD1 and the like, it is determined whether a request for the control transfer is made or not (step S51). When the request is not made, the process is finished.

When the request for the control transfer is made, a tentative judgment of the authentication level is made from the prices of the commodities desired to be purchased based on Table 2 (step S52). Here, the request contents from the second communication terminal PD2, that is, the commodities desired to be purchased, the prices thereof, and the information regarding the authentication such as the ID information regarding the billing of the customer and the like are transmitted to the authentication management company BS (step S53). Next, in the first communication terminal, it is determined from the commodity prices whether or not the commodities are of the low level which does not require the approval of the authentication management company BS. If the approval is not required, the commodities are immediately provided (step S58). When the approval is required, it is determined whether the correction of the authentication level is required or not based on Table 4 in the authentication management company BS. When the correction is required, the process returns to step S54 after the correction of the authentication level and, when the correction is not required or becomes unnecessary because of the correction of the authentication level, the process advances to the judgment (step S57) as to whether the authentication is approved or not in the authentication management company BS.

When the approval is granted in step S57, the commodities are provided (step S58) and, when the approval is not granted, the second communication terminal PD2 is notified of the approval

25

rejected (step S59).

After the commodities are provided, as in the authentication level3, it is determined whether an ex post facto confirmation is required or not (step S60). When the ex post facto confirmation is required, the information regarding the purchase of the commodities and the like is transmitted from the authentication management company BS to the second communication terminal PD2 (step S61).

Needless to say, the control transfer regarding the billing can be adapted to any service equipment using any communication terminals other than the television set TV.

The mobile communication apparatus of the present invention is also realized by a program that allows a computer to function as the present mobile communication apparatus. This program may be housed in a storage medium capable of being read by a computer.

The storage medium which stores this program may be the first storage means MEM1 itself shown in FIG.1, or CD-ROM and the like, wherein a program reading unit such as CD-ROM drive and the like as an external storage unit is provided, and CD-ROM can be read by being inserted into it.

Further, the above described storage medium may be a magnetic tape, a cassette tape, a floppy disc, a hard disc, MO/MD/DVD and the like or a semiconductor memory.

INDUSTRIAL APPLICABILITY

According to the present invention, an authentication system, a host computer, a mobile communication apparatus, a program and a storage medium for the use of the authentication system are provided capable of guaranteeing the optimum utility

26

for the customer and realizing an adequate authentication processing when various kinds of commodities and services are provided.